



City of Aurora Building Division
Project: Revisions To One Line
Address: 12251 E. Cornell Ave.
Occupancy Group: IBC R-2
Construction Type: IBC VB-SPK
RSN: 1411585
Permit: 19-1711111



Front Range Electrical Engineering
3333 S. Walden Blvd., Suite 2010, Lakewood, CO 80227
Fax: 720.638.8870 Ph: 303.985.0548

CORNELL SENIOR APARTMENTS
12251 E. CORNELL AVE.
AURORA, CO 80014



Table with 2 columns: ISSUE, DATE. Includes entries for SD PRICING SET (04.02.18), PERMIT SUBMITTAL (06.18.18), CITY RESPONSE (08.23.18), ADDENDUM 2 (09.17.18), ADDENDUM 3 (10.31.18), ASI 1 (01.10.19), ELECTRICAL REVISIONS (10.04.19).

JOB NUMBER: PROJ. NO.

ELECTRICAL ONE LINE DIAGRAM

E0.20

Feeder Schedule and Feeder Schedule - Aluminum tables. Includes conductor sizes, ampacities, and notes on ampacity selection and grounding.

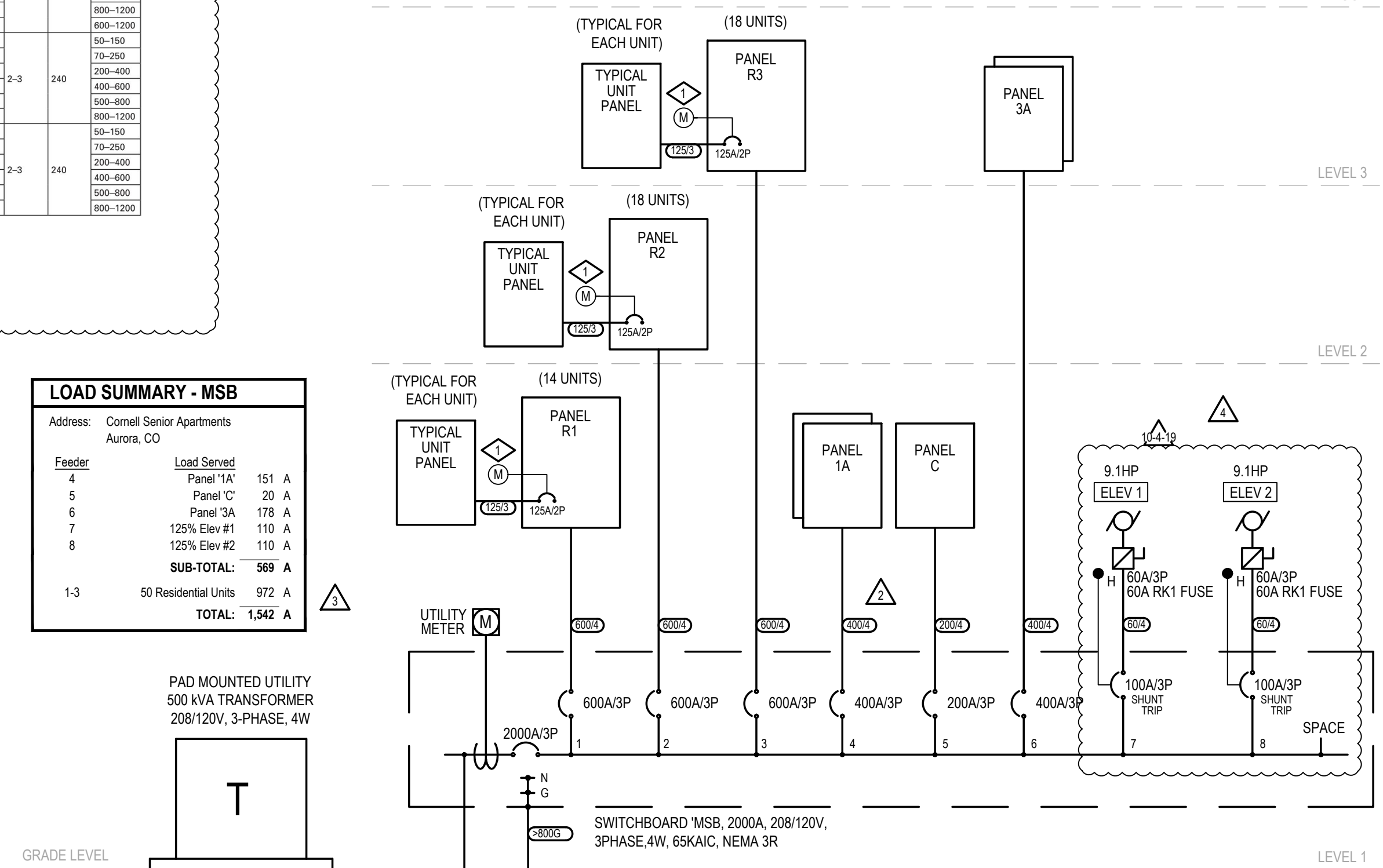
Molded Case Circuit Breakers

Series Connected Short Circuit Ratings and 240V Series Ratings (Continued) tables. Lists breaker models, ratings, and ampere capacities.

Service Equipment shall be permanently and legibly marked to show the available fault current and date the calculation was performed. 2017 NEC 110.24(A)(B).

FAULT CURRENT CALCULATION TABLE. Includes columns for LOCATION, # of RUNS, CONDUCTOR, VOLTAGE, L(ft), C, Total C, I, M, F, and AVAILABLE FAULT CURRENT (F).

LOAD SUMMARY - MSB. Lists Feeder, Load Served, and Total load of 1,542 A.



Provide a Grounded Electrode System bonded to the service equipment enclosure, grounded conductors, and grounded electrode conductors per 2017 NEC 250.50 and 250.104.

ONE LINE DIAGRAM

- N.T.S.
1. E.C. TO FIELD VERIFY EXISTING CONDITIONS
2. ALL EXTERIOR EQUIPMENT TO BE WEATHERPROOF
3. FIELD VERIFY INSTALLATION REQUIREMENTS WITH UTILITY CO. PRIOR TO ANY ROUGH-IN.
4. PROVIDE OUTLET WITHIN 25' OF EQUIPMENT IN ACCORDANCE WITH NEC 210-63.
5. FIELD VERIFY FINAL LOCATION OF ALL EQUIPMENT WITH PROVIDER PRIOR TO ROUGH-IN.
6. UTILITY TRANSFORMERS ARE LIMITED BY THE UTILITY COMPANY TO A TOTAL OF 4 RUNS MAXIMUM OUT OF THE TRANSFORMER SECONDARY. THE E.C. SHALL PROVIDE A SECONDARY CONNECTION CABINET FOR MORE THAN 4 RUNS AND ALL WORK AND SPACE REQUIREMENTS MUST BE COORDINATED WITH THE OWNER, ARCHITECT AND ENGINEER. WHERE ALUMINUM CONDUCTORS ARE USED VERIFY IF A CONNECTION CABINET IS REQUIRED.

- ONE LINE DIAGRAM KEYED NOTES:
1. PROVIDE TENANT SUB-METERING SYSTEM PER ENERGY CODE (IECC) REQUIREMENTS. PROVIDE SIEMENS SEM3 SERIES EMBEDDED MICRO METERING MODULES FOR BILLING GRADE METERING OF EACH RESIDENTIAL UNIT AND EACH COMMERCIAL RETAIL TENANT SPACE. PROVIDE kWh CONSUMPTION AND kW PEAK DEMAND RECORDING CAPABILITY FOR MAIN SWITCHES SERVING EAST AND WEST RESIDENTIAL UNIT DISTRIBUTION PANEL BOARDS FOR SEPARATE METERING OF EAST AND WEST SIDE ELECTRICAL USAGE. VERIFY REQUIREMENTS WITH OWNER AND SUB-METERING SYSTEM PROVIDER AND PROVIDE ALL COMMUNICATION LINES AND ALL WORK REQUIRED FOR A COMPLETE INSTALLATION.



City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: Erick B.
Date: Oct 10, 2019

RSN: 1411585
Permit #: 19-1711111

Code violations that are found during inspection are required to be corrected. Permit issuance does not grant approval of a code violation.

Field Inspection consultation is available upon request. Call 303-739-7420 to request a consultation



### GENERAL NOTES

#### ELECTRICAL APARTMENT UNIT GENERAL NOTES:

- THE ELECTRICAL CONTRACTOR SHALL PROVIDE OUTLETS, LIGHTING AND BRANCH CIRCUITS AS REQUIRED IN ACCORDANCE WITH NEC ARTICLE 210. DEVICES QUANTITIES AND LOCATIONS SHALL BE APPROVED BY LOCAL ELECTRICAL INSPECTOR.
  - RECEPTACLES SHALL BE PROVIDED FOR WALL SPACES IN EXCESS OF 24" WIDE AND NO POINT OF WALL SPACE SHALL BE FURTHER THAN 6' FROM A RECEPTACLE PER NEC 210-52.
  - WALL COUNTERTOP RECEPTACLES SHALL BE PROVIDED FOR WALLS 12" OR WIDER AND NO POINT OF WALL SPACE SHALL BE FURTHER THAN 24" FROM A RECEPTACLE PER NEC 210-52. FIELD VERIFY OUTLET HEIGHTS AND LOCATIONS WITH OWNER TO COMPLY WITH NEC REQUIREMENTS AND ALSO TO ACCOMMODATE SURFACE FINISHES SUCH AS TILE, TRIM AND BACKSPASHES WHERE POSSIBLE. INSTALL AT LEAST ONE OUTLET FOR PENINSULA AND ISLAND COUNTERTOPS, THIS OUTLET MAY BE INSTALLED NO LESS THAN 12" BELOW COUNTER TOP PER NEC 210.52.
- ACCESSIBILITY - ELECTRICAL DEVICES SHALL BE LOCATED SUCH THAT THEY ARE ACCESSIBLE IN ACCORDANCE WITH ANSI REQUIREMENTS. LOCATE OUTLETS, SWITCHES AND DEVICES BETWEEN 15" AND 48" (TOP OF TOGGLE) FOR UNOBSTRUCTED FORWARD AND SIDE REACH AREAS. FOR OBSTRUCTED AREAS THE FORWARD REACH SHALL NOT EXCEED 25" AND WHERE OVER 20" THE HEIGHT SHALL BE LIMITED TO 44" PER ANSI 308.2. FOR OBSTRUCTED AREAS THE SIDE REACH SHALL NOT EXCEED 24" AND WHERE OVER 10" THE HEIGHT SHALL BE LIMITED TO 46" PER ANSI 308.3. AT LEAST ONE OUTLET SHALL BE INSTALLED A MINIMUM OF 36" FROM THE CORNER OF A KITCHEN WORK SURFACE OR AS REQUIRED TO MEET THE OBSTRUCTED SIDE REACH REQUIREMENT.
- KITCHEN OVENRANGE AND ANY ELECTRIC DRYER SHALL BE SUPPLIED BY A 4-WIRE RECEPTACLE AND CONNECTED TO THE BRANCH CIRCUIT EQUIPMENT GROUND CONDUCTOR PER NEC ARTICLE 250.140.
  - OVEN BRANCH CIRCUIT SHALL BE MINIMUM 3#6#10G, 1" FOR 50A (OR 3#8#10G, 1" FOR 40A) COPPER.
  - DRYER BRANCH CIRCUIT SHALL BE MINIMUM 3#10#10G, 3/4" COPPER.
- FIELD VERIFY FINAL LOCATION AND REQUIREMENTS OF HVAC EQUIPMENT WITH PROVIDER.
- ALL 125-VOLT 15- AND 20-AMPERE RECEPTACLES SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES IN ACCORDANCE WITH NEC 406.12.
- ALL BRANCH CIRCUITS (INCLUDING OUTLET, LIGHTING AND SMOKE DETECTORS) SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION TYPE PER NEC 210-12.
- ALL RECEPTACLES IN BATHROOMS, GARAGES, OUTDOORS, CRAWL SPACES, UNFINISHED BASEMENTS, LAUNDRY, KITCHENS, AND WITHIN 6 FEET OF UTILITY AND WET-BAR SINKS SHALL BE GFCI PER NEC 210.8(A). THE E.C. SHALL PROVIDE GFCI OUTLETS IN ALL LOCATIONS REQUIRED BY THE NEC. ALL GFCI DEVICES SHALL REMAIN READILY ACCESSIBLE.
- PROVIDE SEPARATE DEDICATED CIRCUITS FOR BATHROOM RECEPTACLE OUTLETS IN ACCORDANCE WITH NEC 210.11(C)(3).
- ALL EXTERIOR RECEPTACLES SHALL BE WEATHER RESISTANT PER NEC 406.9 AND ENCLOSED IN A WEATHERPROOF ENCLOSURE WHILE IN USE.
- FIELD VERIFY FINAL LOCATION OF PANELBOARDS WITH OWNER PRIOR TO ROUGH-IN. LOCATE PANELBOARD SUCH THAT WORKING CLEARANCE IS MAINTAINED IN ACCORDANCE WITH NEC 110. FIELD VERIFY FINAL LOCATION AND COORDINATE WITH OTHER TRADES.
- FIXTURES IN CLOTHES CLOSETS SHALL BE COMPLY WITH NEC 410.16 REGARDING DISTANCES FROM STORAGE AREAS AND TYPE OF FIXTURE. ALL LAMPS SHALL BE ENCLOSED; FIXTURES WITH EXPOSED LAMPS ARE NOT PERMITTED.
- LIGHTING WITHIN DWELLING UNITS SHALL HAVE 75 PERCENT OR MORE OF THE PERMANENTLY INSTALLED INTERIOR LIGHT FIXTURES FITTED WITH HIGH-EFFICACY LAMPS.
- COMMUNICATION SYSTEMS - PROVIDE COMPLETE COMMUNICATION SYSTEMS WIRING AND DEVICES AS REQUIRED FOR TELEPHONE, DATA, INTERNET, SATV, CATV SERVICES.
  - FIELD VERIFY FINAL QUANTITY, LOCATION, AND REQUIREMENTS OF ALL TELEPHONE, DATA, INTERNET AND TV DEVICE JACKS AND OUTLETS WITH OWNER.
  - COMMUNICATION BOX - FOR EACH UNIT IN THE WALK-IN CLOSET PROVIDE 12" x 14" x 4" FLUSH MOUNTED WALL BOX FOR ALL COMMUNICATION CABLES (TELEPHONE, DATA, INTERNET, SATV, CATV) AS REQUIRED TO ACCOMMODATE SEPARATE SERVICE FROM EACH PROVIDER. PROVIDE A PHONE TERMINAL BOX AND COAX SPLITTER TO ACCOMMODATE THE NUMBER OF PHONE/DATA AND TV DEVICES PLUS ONE SPARE FOR EACH. PROVIDE A DEDICATED CIRCUIT AND 4-PLEX OUTLET INSIDE BOX.
  - IF COMPLETE COMMUNICATION SERVICES ARE NOT FULLY INSTALLED DURING CONSTRUCTION, PROVIDE RACEWAY OR COORDINATE WITH G.C. SUCH THAT SERVICE PROVIDER CABLES MAY BE INSTALLED AFTER CONSTRUCTION IS COMPLETE.
- CEILING FAN BOXES - PROVIDE ADD ALTERNATE TO INSTALL JUNCTION BOX RATED FOR STRUCTURAL SUPPORT AND USE WITH CEILING FAN IN BEDROOMS. PROVIDE WIRING FOR SEPARATE WALLBOX CONTROL OF FAN SPEED AND LIGHT KIT. FIELD VERIFY REQUIREMENTS WITH OWNER PRIOR TO ANY WORK.
- PROVIDE SMOKE DETECTORS THROUGHOUT UNIT AS REQUIRED IN ACCORDANCE WITH ALL NATIONAL, STATE, AND LOCAL CODE REQUIREMENTS. INSTALL DETECTOR IN EACH ROOM THAT MAY BE USED FOR SLEEPING AND ALL HALLWAYS LEADING TO SLEEPING ROOM. PROVIDE ADDITIONAL DETECTORS ON NON-CONTINUOUS PLANE CEILINGS AS REQUIRED.
- PROVIDE A CO DETECTOR AND ALARM WITHIN 15 FEET OF ALL ROOMS USED FOR SLEEPING PURPOSES AND INSTALL IN ACCORDANCE WITH STATE LAW AND LOCAL CODES.
- VERIFY FAN COIL AND CONDENSING UNIT SIZE, LOCATION, BREAKER SIZES, AND NAMEPLATE ELECTRICAL REQUIREMENTS BEFORE ANY WORK.
- PROVIDE CONDUIT IN WALL FOR HIGH TV LOCATIONS.

#### KEYED NOTES

- MOUNT OUTLET NO MORE THAN 12" BELOW COUNTERTOP.
- PROVIDE LEVITON T5832 TAMPER RESISTANT USB CHARGER RECEPTACLE OR EQUAL RECEPTACLE AT KITCHEN COUNTERS SHALL BE GFCI PROTECTED.

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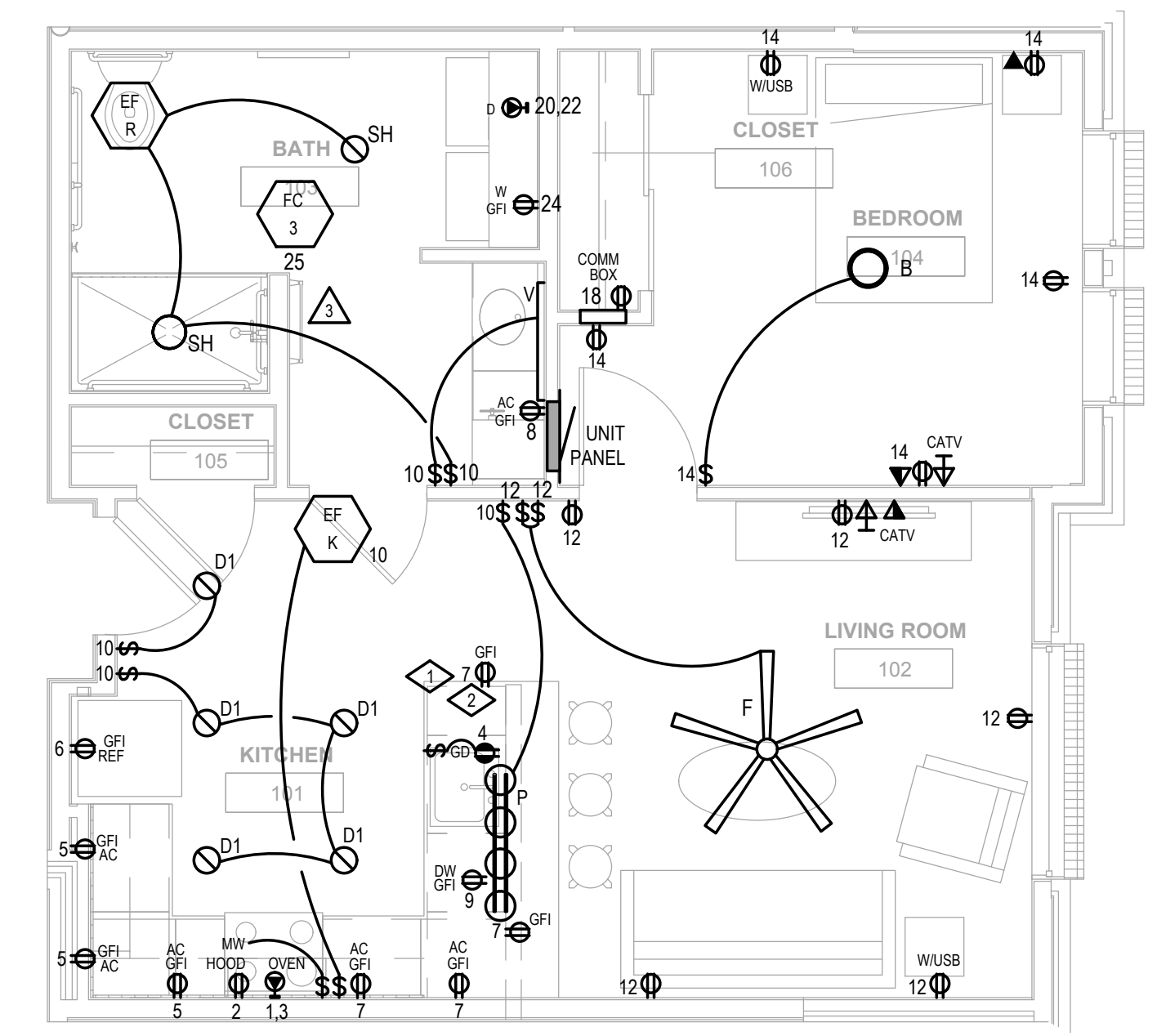
PANEL SCHEDULE: Typical 1BR												
October 4, 2019												
BUS RATING: 125A 10, 3-WIRE VOLTAGE L-L: 208												
MAIN C.B.: 125A/2P or M.L.O. VOLTAGE L-G: 120												
MOUNTING: Flush S.C.RMS RATING (AIC): 100K Minimum Series Rating, Combination of SIEMENS Type NGB Feeder and Type QP Branch Breakers												
COMMENTS: New Panelboard												
CR NO.	CIRCUIT NO.	BREAKER POLE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	DESCRIPTION OF LOAD SERVED	PHASE	DESCRIPTION OF LOAD SERVED	NEC DEMAND FACTOR	CONNECTED LOAD (VA)	CIRCUIT BREAKER POLE	CR NO.	
1	40	2	4000	1.00	Oven/Range	A	Microwave/Hood	1.00	1200	1	20	2
3	40	2	4000	1.00	Oven/Range	B	Disposal	1.00	1176	1	20	4
5	20	1	1500	1.00	Appliance Ckt Kitchen	A	Refrigerator	1.00	750	1	20	6
7	20	1	1500	1.00	Appliance Ckt Kitchen	B	Bath GFI	1.00	180	1	20	8
9	20	1	750	1.00	Dishwasher	A	Lights/Recept	1.00	1250	1	20	10
11					Bussed Space	B	Lights/Recept	1.00	1250	1	20	12
13					Bussed Space	B	Lights/Recept	1.00	1250	1	20	14
15					Bussed Space	B	Lights/Recept	1.00	1250	1	20	16
17	20	1			Spare	A	Bussed Space					18
19	20	1			Spare	B	Dryer	1.00	2500	2	30	20
21	20	1			Spare	A	Dryer	1.00	2500	2	30	22
23	20	1	250	1.00	Smoke Detectors	B	Washer	1.00	1200	1	20	24
25	15	1	600	1.00	FC-1/3	A	Bussed Space					26
27	15	2	1217	1.00	CU-1	B	Bussed Space					28
29	15	2	1217	1.00	CU-1	A	Communications Box	1.00	180	1	20	30

- NOTES:
- Branch circuits shall be protected by a listed arc-fault circuit interrupter, combination type, installed to provide protection of the branch circuit per NEC 210.12
  - Provide GFCI and combination AFCI/GFCI type circuit breakers as required where outlets are installed in any condition that is not readily accessible. All test switches shall be installed in accessible locations including breakers with test switches located inside unit panels, adjust panel mounting heights as required.
  - Provide separate neutral conductors for each circuit or provide multiple breakers or breaker ties in accordance with NEC 210.4(B) and 140.15(B).
  - 15A circuit breakers may be used for general purpose lighting and receptacles if acceptable with owner.
  - Confirm breaker sizes (HVAC, equipment, appliances, etc.) with nameplate data before ordering any materials and provide all work necessary for a complete and code compliant installation.

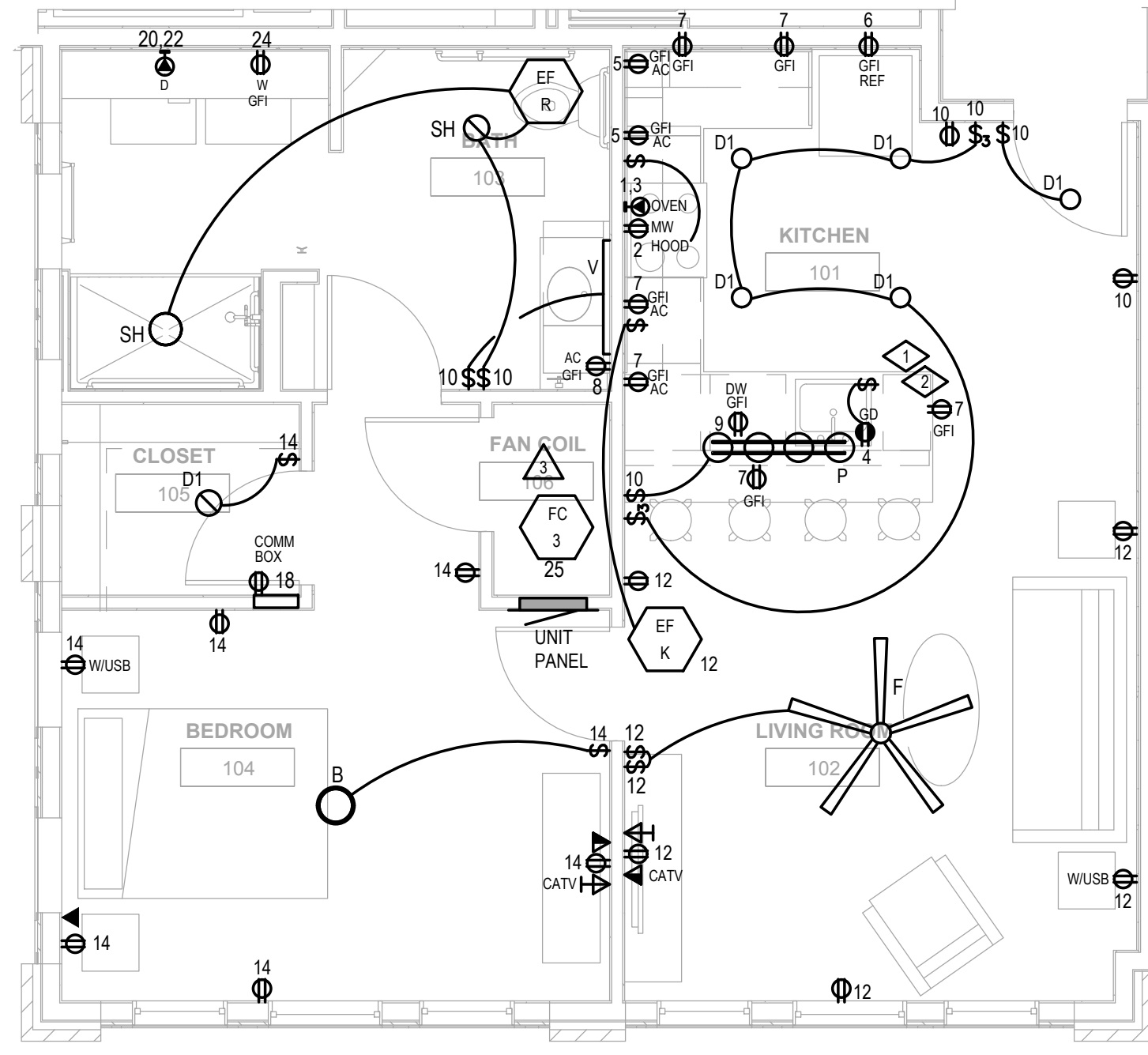
Service Equipment shall be permanently and legibly marked to show the available fault current and date the calculation was performed. 2017 NEC 110.24(A)(B).

Every circuit and circuit modification shall be legibly identified as to it's clear, evident and specific purpose or use. The identification shall include an approved degree of detail that allows each circuit to be distinguished from all others. 2017 NEC 408.4

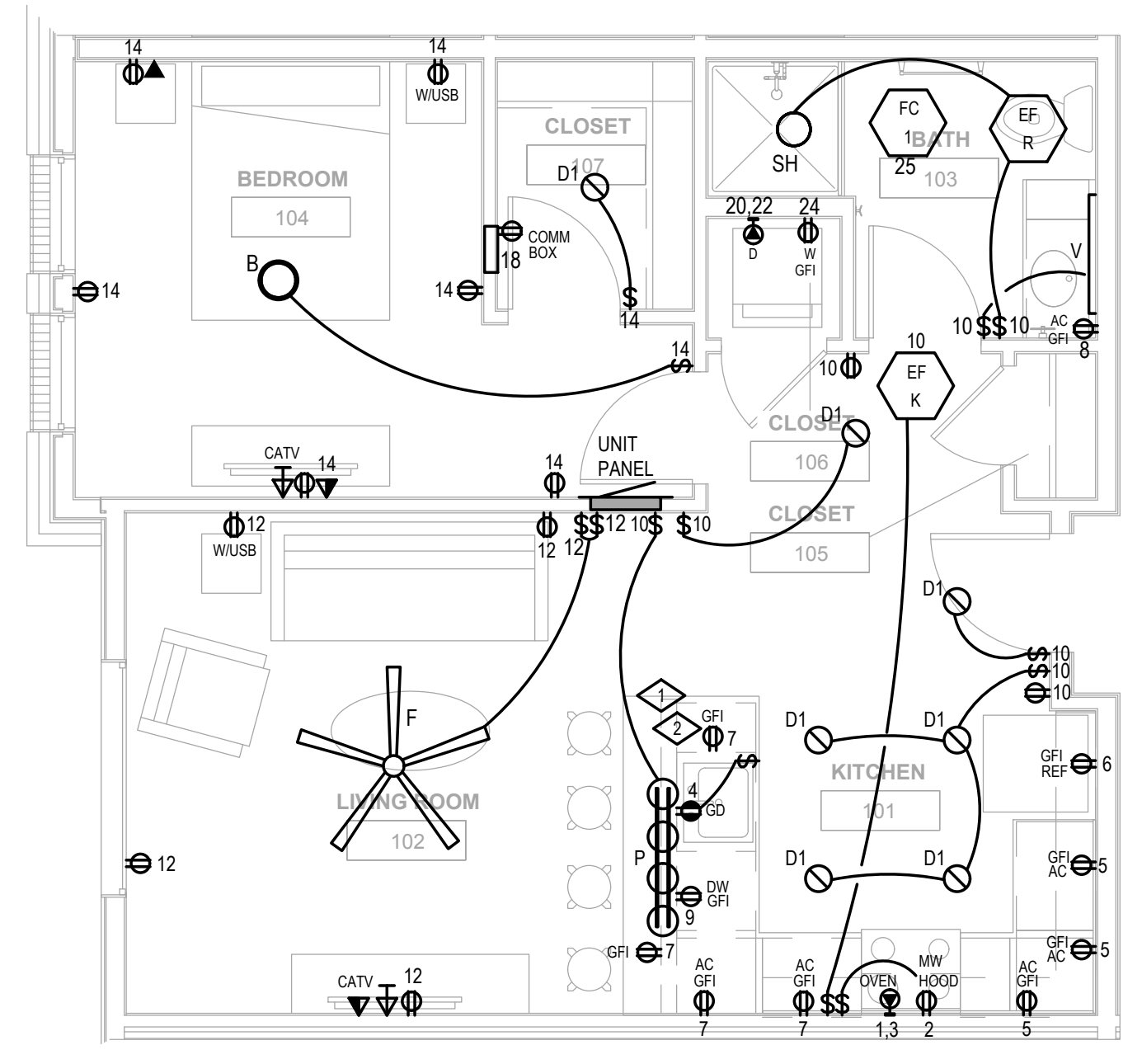
Only highlighted or clouded revisions are approved on this review. All previous comments apply.



3 UNIT 1BR B TYPE A - ELECTRICAL PLAN  
1/4" = 1'-0"



2 UNIT 1BR A TYPE A - ELECTRICAL PLAN  
1/4" = 1'-0"



1 UNIT 1BR - ELECTRICAL PLAN  
1/4" = 1'-0"

## CORNELL SENIOR APARTMENTS

12251 E. CORNELL AVE.  
AURORA, CO 80014



ISSUE	DATE
SD PRICING SET	04.02.18
PERMIT SUBMITTAL	06.15.18
CITY RESPONSE	08.23.18
ADDENDUM 2	09.17.18
ADDENDUM 3	10.31.18
ELECTRICAL REVISIONS	10.04.19

JOB NUMBER: PROJ. NO.

### ELECTRICAL UNIT PLANS

# E3.01



City of Aurora Building Division  
Reviewed for Code Compliance  
Approved as Noted: Erick B.  
Date: Oct 10, 2019  
2015 INTERNATIONAL CODES & 2017 NEC

RSN: 1411585  
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ELECTRICAL REVISIONS	10.04.19

JOB NUMBER: PROJ. NO.

**ELECTRICAL UNIT  
PLANS**

**E3.02**

**GENERAL NOTES**

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    - RECEPTACLES SHALL BE PROVIDED FOR WALL SPACES IN EXCESS OF 24" WIDE AND NO POINT OF WALL SPACE SHALL BE FURTHER THAN 6' FROM A RECEPTACLE PER NEC 210-52.
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**PANEL SCHEDULE: Typical 2BR** October 4, 2019

BUS RATING: 125A 10, 3-WIRE VOLTAGE L-L: 208  
MAIN C.B.: 125A/2P or M.L.O. VOLTAGE L-G: 120  
MOUNTING: Flush S.C.R.M.S RATING (AIC): 100k Minimum Series Rating, Combination of SIEMENS Type NGB Feeder and Type QP Branch Breakers

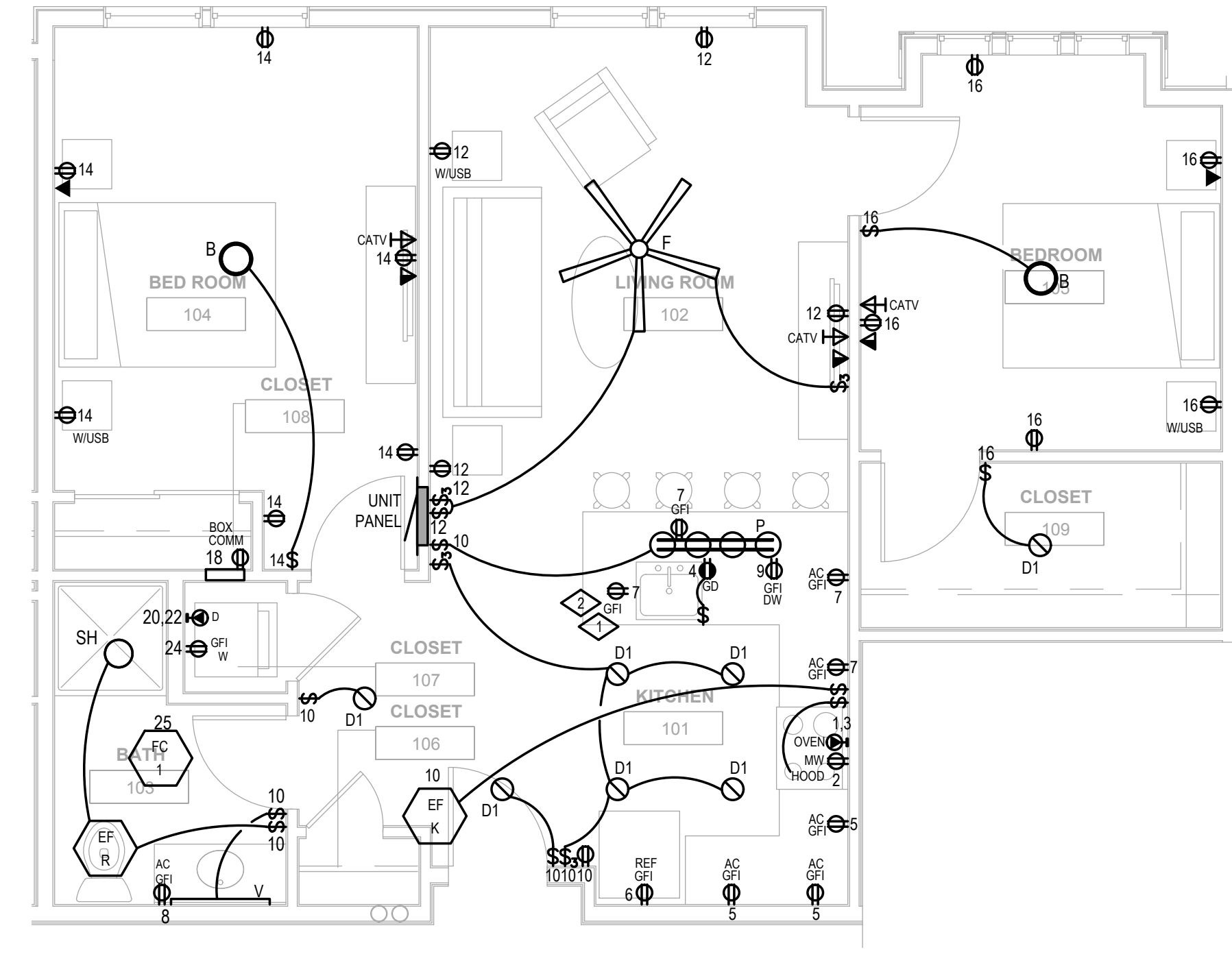
COMMENTS: New Panelboard

CR NO.	CIRCUIT NO.	BREAKER POLE	CONNECTED LOAD (VA)	NEC DEMAND FACTOR	DESCRIPTION OF LOAD SERVED	PHASE	DESCRIPTION OF LOAD SERVED	NEC DEMAND FACTOR	CONNECTED LOAD (VA)	CIRCUIT BREAKER POLE	CR NO.	
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7	20	1	1500	1.00	Appliance Ckt Kitch/Dining	B	Bath GFI	1.00	180	1	20	8
9	20	1	750	1.00	Dishwasher	A	Lights/Recept	1.00	1250	1	20	10
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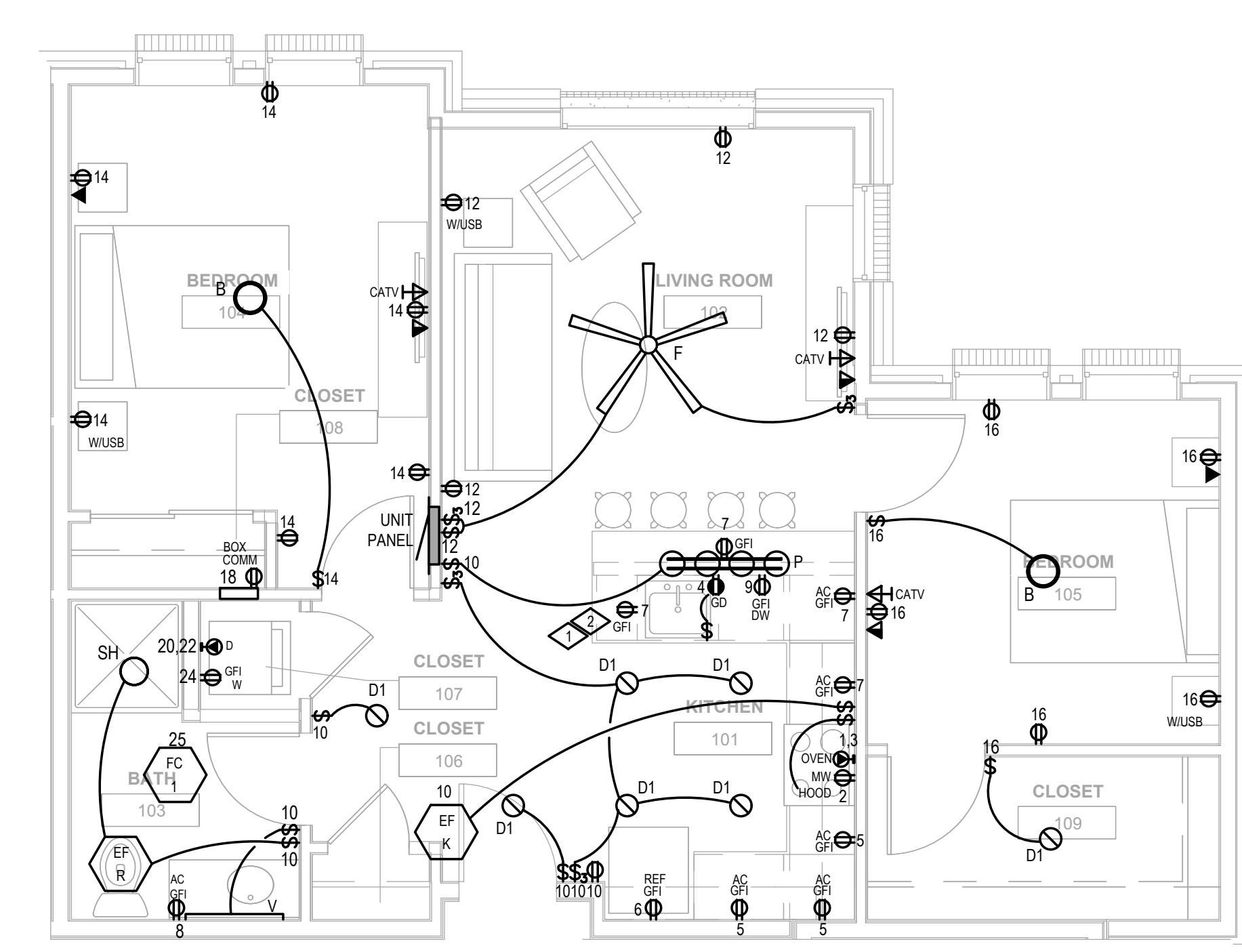
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**2 UNIT 2BR B - ELECTRICAL PLAN**  
1/4" = 1'-0"



**1 UNIT 2BR A - ELECTRICAL PLAN**  
1/4" = 1'-0"

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